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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,298	11/18/2005	Klaus Rutz	29805.132.3	4353

7590 07/19/2011

Merchant & Gould, P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903

EXAMINER	
STIMPERT, PHILIP EARL	

ART UNIT	PAPER NUMBER
3746	

MAIL DATE	DELIVERY MODE
07/19/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/554,298	RUTZ ET AL.	
	Examiner	Art Unit	
	PHILIP STIMPERT	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,12,13,15-17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,12,13,15-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7, 12, 13, 15-17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent US 6,457,944 to Haberlander et al. (Haberlander hereinafter) in view of US PGPub 2002/0067148 to Moddemann (Moddemann), US Patent 5,482,448 to Atwater et al. (Atwater), and Jacobs et al. (Jacobs).

3. Regarding claim 13, Haberlander teaches a method for controlling a pump (1, see col. 5, ln. 65-67) including a pump element which may be a diaphragm (col. 2 ln. 27) that is actuated by a ram (2, see col. 5, ln. 50-55) which is powered by an electric motor (3), comprising reciprocating the pumping element by rotation of the cam. Haberlander teaches that the reciprocation takes place in a first direction for a compression, or pressure, stroke and in a second direction for an aspiration, or suction, stroke. Haberlander also teaches providing input of a required quantity, in the form of a pump stroke and a total dosing volume, to a positional controller (8, col. 6, ln. 63 through col. 7 ln. 2, and col. 7, ln. 39-41) that is coupled to a motor controller (4). Haberlander further teaches providing input of a current position of the rotating cam (from sensors 11) to the controller (8), calculating a currently required rotating speed based on the position and required quantity (col. 7, ln. 17-41), and transmitting that

required speed to the motor controller (4). Haberlander does not specifically teach that the motor is an electronically commutated (EC) motor. However, Haberlander does teach that at least frequency and thus rotational rate control is necessary for their method, and realized by their pump. Moddemann teaches an EC motor (2), and teaches that it has position and speed control capabilities (paragraph 15). It is thus apparent to those of ordinary skill in the art that the EC motor of Moddemann could be substituted for the asynchronous motor of Haberlander by known methods of motor installation and control circuit linkage, to achieve the predictable result of an operational metering pump as in the system of Haberlander. Where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, since the applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing KSR, 127 S.Ct. at 1740, 82 USPQ2d at 1396.
Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary

skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another. Thus provided, the EC motor of Moddemann would produce rotation of the rotor via a rotating magnetic field as claimed, under the control of the motor controller (9, 10).

4. Haberlander also does not teach varying the rotating speed of the cam during a compression stroke of the pump. Atwater teaches a piston pump with a cam that causes the piston to reciprocate axially. In particular, Atwater teaches increasing the speed of the motor at either end of a piston stroke in order to even out pump flow (col. 8, ln. 15-24). Therefore, since Haberlander is directed to maintaining a constant flow rate, it would have been obvious to one of ordinary skill in the art at the time of the invention to increase the motor speed of Haberlander at the beginning and end of the pump's delivery stroke, in order to maintain a more constant delivery rate.

5. Finally, none of Haberlander, Moddemann, or Atwater teach increasing the rotational speed of the motor sufficiently to increase the quantity of medium delivered per time. Jacobs teaches that in a metering pump system the fluid dispense velocity may be raised at the end of a discharge stroke in order to reduce perfusion and increase accuracy of dispensing (see paragraphs 22 and 28). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to increase the speed of the motor of the modified pump of Haberlander in a dispensing application in order to reduce perfusion and increase accuracy of dispensing. The examiner notes that neither the claim nor Haberlander discusses any particular delivery device or

application for the fluids being dosed or metered, and as such, the pump of Haberlander and that of the claim appear to be applicable to analytical dispensing uses as discussed in Jacobs.

6. Regarding claims 7 and 12, Moddemann teaches capturing the position of the motor via an integral rotor position sensor (11). Those of ordinary skill would appreciate that such a position would be directly analogous to the position of the cam of Haberlander et al., since the cam would be directly coupled to the rotor. Further, as Haberlander et al. teach providing position data to the positional controller (8), this implies at least an operational coupling of the positional controller and any position sensor.

7. Regarding claim 15, Haberlander et al. teach a method for controlling a pump (1, see col. 5, ln. 65-67) including a pump element which may be a diaphragm (col. 2 ln. 27) that is actuated by a ram (2, see col. 5, ln. 50-55) which is powered by an electric motor (3), comprising reciprocating the pumping element by rotation of the cam. Haberlander teaches that the reciprocation takes place in a first direction for a compression, or pressure, stroke and section for an aspiration, or suction, stroke. Haberlander et al. teach that the electric motor (3) is asynchronous, and that the operating speed thereof may be varied (such as during the suction cycle). Haberlander et al. do not teach varying the rotating speed of the cam during a compression stroke of the pump. Atwater teaches increasing the speed of the motor at either end of a piston stroke in order to even out pump flow (col. 8, ln. 15-24). Therefore, since Haberlander is directed to maintaining a constant flow rate, it would have been obvious to one of

ordinary skill in the art at the time of the invention to increase the motor speed of Haberlander at the beginning and end of the pump's delivery stroke, in order to maintain a more constant delivery rate. Thus modified, one of ordinary skill would appreciate that the rotational speed of the cam would decrease to a minimum halfway through the compression stroke, as the component of the cam's movement in the direction of the stroke would be maximum at that point in the stroke and the rotation speed would decrease to it's minimum to maintain the constant linear motion of the diaphragm. Further, Haberlander teaches that it is “possible to significantly shorten the suction cycle relative to the pressure cycle” and that this results in a reduced gap in dosing. Thus it would be obvious to accelerate the rotating speed of the cam from a minimum to a maximum speed starting approximately halfway through the compression stroke so as to maintain the constant linear speed of the diaphragm, and to maintain the maximum rotating speed through the aspiration stroke to minimize the time duration of that stroke. Further, Haberlander et al. do not specifically teach that the motor is an electronically commutated (EC) motor. However, they do teach that at least frequency and thus rotational rate control is necessary for their method, and realized by their pump. Moddemann teaches an EC motor (2), and teaches that it has position and speed control capabilities (paragraph 15). It is thus apparent to those of ordinary skill in the art that the EC motor of Moddemann could be substituted for the asynchronous motor of Haberlander et al. by known methods of motor installation and control circuit linkage, to achieve the predictable result of an operational metering pump as in the system of Haberlander, as above with respect to claim 13.

8. Regarding claim 16, Haberlander et al. teach that the rotational speed of the motor is varied based on a sensed rotor position or a sensed cam position (col. 6, ln. 25-34). One of ordinary skill would appreciate that sensing the one is equivalent to sensing the other, given that they are utilized to determine fore and back dead center positions, and that thus both are sensed and utilized in the control algorithm. Further, since the motor of the combination is an electrically commuted motor, the operation is independent of the load on the motor.

9. Regarding claim 17, according to the combination, the cam is kept at a maximum rotating speed during the aspiration stroke and would thus tend to begin the compression stroke (which the examiner notes begins at the end of the aspiration stroke) at that maximum speed. Further, the component of the cam's movement in the direction of the diaphragm stroke would be minimum at the beginning and end of the compression stroke, thus in order to maintain a constant linear motion, the rotational speed would necessarily be maximum at the start of the compression stroke. This velocity profile is as described by Atwater (col. 8, ln. 16-24).

10. Regarding claim 19, Haberlander teaches operating the motor at a substantially constant (maximum) speed during the aspiration stroke (col. 7, ln. 45-48). With a constant profile cam, this will lead to a variation in the linear speed of the ram.

11. Regarding claim 20, Haberlander teaches that by maximizing the speed during the aspiration stroke, the aspiration stroke is made much shorter than the compression stroke (col. 8, ln 49-54). Since the ram travels the same distance in both strokes, its average speed will be lower during the compression stroke than the aspiration stroke.

Response to Arguments

12. Applicant's arguments filed 25 April 2011 have been fully considered but they are not persuasive.

13. With respect to the argument that Jacobs does not teach the claimed increase in velocity at the end of the compression stroke, the examiner disagrees. First, and primarily, Jacobs repeatedly uses the phrase "an increase in fluid flow rate" (see for instance paragraph 73). This is accomplished by an increase in rotating speed of the pump for the express purpose of raising the velocity of the fluid at the dispenser and thereby avoiding residue buildup and measurement inaccuracy. The increase is stated in absolute terms, rather than relative to a nominal rate of decrease of fluid flow, as alleged by applicants. Further, Jacobs also indicates that when determining the offset (for causing the increase in speed), various factors should be taken into account, including the fluid flow rate profile (paragraph 73). This indicates that the method taught by Jacobs is applicable to different flow rate profiles than the precise ones taught by Jacobs (such as in Fig. 6). Therefore, one of ordinary skill would expect that the advantages discussed by Jacobs could be realized in an otherwise constant flow system, such as that of Haberlander as modified particularly by Atwater.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHILIP STIMPERT whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/P. S./
Examiner, Art Unit 3746
13 July 2011